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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,636	05/02/2001	Jiebo Luo	79704DMW	6601

1333 7590 03/25/2004

PATENT LEGAL STAFF
EASTMAN KODAK COMPANY
343 STATE STREET
ROCHESTER, NY 14650-2201

EXAMINER

FOULADI SEMNANI, FARANAK

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,636

Applicant(s)

LUO ET AL.

Examiner

Faranak Fouladi

Art Unit

2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to:
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: application, filed on 05/02/01 and IDS filed on 01/09/04.
2. Claims 1-35 are pending in the case, with claims 1, 14, 15, 19, 31 and 35 being independent.
3. The present title of the application is "Block sampling based method and apparatus for texture synthesis" (as originally filed).

Claim Rejections - 35 USC § 112

- ◆ The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 14-18 and 31-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Subject matters "determining the direction of the image texture" and "calculating an offset angle" are not described in specification. There is no description on how the direction of the texture image is determined and there is no description on how an offset angle is determined.

Applicant states on page 24 line 29 - page 25 line 5 "It is non-trivial to ensure that the synthetic texture image retains the same directionality. The difficulties reside in two aspects. First, it is extremely difficult to precisely model the directionality of the texture in a mathematical form with a limited number of parameters. Second, it is also extremely difficult to incorporate such information into texture analysis/synthesis algorithms even if the directional information is obtained. In fact, directional texture analysis/synthesis remains largely an open problem within the prior art." And further states on page 26 line 19-22 "It is noteworthy that the effectiveness of the direction estimation method described above is generally limited to directional textures containing linear structures. For example, if a directional texture contains rows of circles, such directionality would be difficult to detect."

From the aforementioned specification, it is not clear to examiner how the direction of the image texture is determined and how is the linearity of the structure determined. Since it is not clear to examiner as to what is exactly being claimed in claims 14-18 and 31-34 no prior art has been used to reject them.



The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 4 recites the limitation "said moving step" in line 2. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 16 recites the limitation "the image" in line 3. There is insufficient antecedent basis for this limitation in the claim.

7. Claims 20-30 recite the limitation "the apparatus" in line 1. There is insufficient antecedent basis for this limitation in these claims.

Claim Rejections - 35 USC § 102

◆ (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13, 19-30 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Bar-Joseph et al. (Bar-Joseph) "Texture Mixing and Texture Movie Synthesis using Statistical Learning" 04/2001 IEEE Transactions on Visualization and Computer Graphics, Vol. 7, No. 2, April-June 2001.

(Manuscript was received at IEEE 12 Aug. 1999; revised 2 Oct. 2000; accepted 3 Oct. 2000.)

1. Regarding independent claim 1, "a method of synthesizing a texture from an array of pixels, comprising the steps of: decomposing the array of pixels through application of a transform to produce a plurality of coefficients ordered to correspond to the array of pixels; defining a plurality of sections within said plurality of coefficients; reordering said plurality of sections, and performing an inverse transform on said reordered plurality of sections." Bar-Joseph disclose in section 3 and in section 4 lines 7-9.

Bar-Joseph discloses a method of synthesizing 2D textures by using a steerable pyramid that is a multi-resolution analysis.

2. Regarding dependent claim 2, "the method of claim 1 wherein the array of pixels is a reference texture image." Bar-Joseph disclose in section 1.2 lines 25-27.
3. Regarding dependent claim 3, "the method of claim 1 wherein said reordered plurality of sections are reordered by random selection." Bar-Joseph disclose in section 2 second column lines 1-5.
4. Regarding dependent claim 4, "the method of claim 1 further comprising the steps of storing said plurality of coefficients in a memory array and wherein said moving step is accomplished by moving coefficient values within said memory array on a section by section basis." Bar-Joseph disclose in section 5.1.
5. Regarding dependent claim 5, "the method of claim 1 wherein the array of pixels is a texture image, and the size of said section is selected to be at least as large as a texel element within the texture image." Bar-Joseph disclose in section 6.1.1 second column lines 2-29.
6. Regarding dependent claim 6, "the method of claim 1 wherein said sections are block shaped." Bar-Joseph disclose in section 3 second column 3rd paragraph lines 12-13.
7. Regarding dependent claim 7, "the method of claim 1 wherein said transform is a steerable wavelet transform that produce said plurality of coefficients as a multi-resolutional representation of the pixels, and said inverse transform is an inverse wavelet transform." Bar-Joseph disclose in section 3 second column 1st and 4th paragraph.

8. Regarding dependent claim 8, "the method of claim 7 wherein said plurality of coefficients includes at least a lowpass band representation of the pixels." Bar-Joseph disclose in section 3 second column 3rd paragraph.
9. Regarding dependent claim 9, "the method of claim 7 wherein said steerable wavelet transform accomplishes a mapping of the pixels from a spatial domain to coefficients in the wavelet domain and said inverse wavelet transform accomplishes a mapping of said plurality of coefficients from the wavelet domain to pixels in the spatial domain." Bar-Joseph disclose in section 6.1.2.
10. Regarding dependent claim 10, "the method of claim 7 wherein said plurality of sections are sampled and said inverse wavelet transform is applied recursively at all resolution levels of said multi-resolutional representation." Bar-Joseph disclose in section 3 second column 3rd and 4th paragraphs.
11. Regarding dependent claim 11, "the method of claim 1 wherein the array of pixels includes a red pixel array, a green pixel array, and a blue pixel array, forming a color image, further comprising the steps of repeating said decomposing and said performing steps three times, for each of the red pixel array, the green pixel array, and the blue pixel array, while utilizing the same defining and reordering steps for each." Bar-Joseph disclose in section 5.1.
12. Regarding dependent claim 12, "the method of claim 1 wherein said texture is scaled to a different size according to a scaling factor, further comprising the steps of: randomly sampling said plurality of sections and moving the coefficients to a number of new sections equal to the number of said plurality of sections

times said scaling factor." Bar-Joseph disclose in section 6.1.1 second column 1st and 2nd paragraphs.

13. Regarding dependent claim 13, "the method of claim 1 wherein said plurality of sections are scaled to a different size according to a scaling factor, further comprising the step of interpolating the coefficient's sizes by said factor." Bar-Joseph disclose in section 6.1.1 second column 3rd paragraphs.
14. Claims 19-30 recite apparatus for performing the method of claims 1-13; therefore they are similar in scope and rejected under the same rationale.
15. Claim 35 recites means for performing the method of claim 1; therefore it is similar in scope and rejected under the same rationale.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892 form.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Faranak Fouladi** whose telephone number is **703-305-3223**. The examiner can normally be reached on Mon-Fri from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi** can be reach at **703-305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks


Washington, DC. 20231

Or faxed to: 703-872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, sixth-floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 703-306-0377.

Faranak Fouladi-Semnani
Patent Examiner
Art Unit 2672



MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600